

CLAIM LISTING

Claims 1-24. (Cancelled)

25. (Previously Presented) A method for pasteurizing or sterilizing a product in liquid form which includes a heat sensitive substance comprising:

substantially atomizing the product in liquid form by admixing steam in a mixing chamber heated by the steam so as to kill microorganisms and produce a pasteurized or sterilized product wherein

the product in liquid form has a solid content of at least 53 wt.%;

the steam is introduced into the mixing chamber at a steam pressure of between about 3 bar and 20 bar;

the temperature in the mixing chamber is between about 120°C and 250°C;

the residence time of the product in the mixing chamber is between about 0.2 msec and 20 msec; and

the weight ratio between the product in liquid form and steam is between about 1.6 and 10; and

drying the pasteurized or sterilized product into powder form.

26. (Previously Presented) The method of claim 25, wherein the mixing chamber has a length of between about 1 cm and 20 cm.

27. (Previously Presented) The method of claim 25, wherein the steam is introduced into the mixing chamber at a steam pressure of between about 5 bar and 15 bar.

28. (Cancelled)

29. (Previously Presented) The method of claim 25, wherein one or more products are selected from the group consisting of peptides, proteins, fats, vitamins, antioxidants, minerals, hormones, steroids, polysaccharides, vegetable oils, and sugars.

30. (Previously Presented) The method of claim 25, wherein the pasteurized or sterilized product leaves the mixing chamber through an outflow opening having a size of less than 6 mm.

31. (Previously Presented) The method of claim 25, wherein the pasteurized or sterilized product leaves the mixing chamber through an outflow opening having a size of less than 5 mm.

32. (Previously Presented) The method of claim 25, wherein the weight ratio between the product in liquid form and steam is between about 1.75 and 7.

33. (Previously Presented) The method of claim 25, wherein the temperature in the mixing chamber is between about 120°C and 150°C.

34. (Previously Presented) The method of claim 25, wherein the product in liquid form is a stable emulsion.

35. (Previously Presented) The method of claim 25, wherein the pasteurized or sterilized product is injected into an expansion vessel.

36. (Previously Presented) The method of claim 35, wherein the expansion vessel is a flash system.

37. (Previously Presented) The method of claim 25, wherein the pasteurized or sterilized product leaving the mixing chamber flows into a drying chamber in which the product is dried.

38. (Previously Presented) The method of claim 37, wherein at least a part of the supplied steam, after leaving the drying chamber, is superheated and returned to the drying chamber.

39. (Cancelled)

40. (Previously Presented) The method of claim 37, wherein the dried product contains an agglomerate of primary powder particles.

41. (Previously Presented) The method of claim 40, wherein the product is dried using at least two nozzles, wherein outflow openings of the nozzles are arranged such that outgoing sprays comprising product and steam contact each other.

42. (Previously Presented) The method of claim 41, wherein non-agglomerated primary particles are recirculated to the drying chamber via at least one of the spray nozzles.

43. (Previously Presented) The method of claim 25, wherein a decimal reduction of at least 2 is reached.

Claims 44-46: (Cancelled)

47. (Previously Presented) The method of claim 25, wherein the solid content is 0.7-6.5 kg per kg steam.

48. (Previously Presented) The method of claim 25, wherein the mixing chamber has inflow openings that are placed such that the steam flow and the product flow enter the mixing chamber in substantially parallel direction.

49. (Previously Presented) The method of claim 25, wherein the mixing chamber has at least one inflow opening for the steam that contains a steam distribution plate.

50. (Previously Presented) The method of claim 25, wherein the steam is brought near the product concentrically around an inflow opening of product in the mixing chamber.

51. (Previously Presented) The method of claim 25, wherein the product comprises proteins, fats, minerals, and carbohydrates.

52. (Previously Presented) The method of claim 25, wherein the steam is atomized in the mixing chamber.